

# PATENT COOPERATION TREATY

PCT

## **NOTIFICATION OF ELECTION**

(PCT Rule 61.2)

## **From the INTERNATIONAL BUREAU**

To:

United States Patent and Trademark  
Office  
(Box PCT)  
Crystal Plaza 2  
Washington, DC 20231  
ÉTATS-UNIS D'AMÉRIQUE

in its capacity as elected Office

<b>Date of mailing</b> (day/month/year) 20 April 1999 (20.04.99)	in its capacity as elected Office
<b>International application No.</b> PCT/GB98/02168	<b>Applicant's or agent's file reference</b> P/11065.WO
<b>International filing date</b> (day/month/year) 20 July 1998 (20.07.98)	<b>Priority date</b> (day/month/year) 24 July 1997 (24.07.97)
<b>Applicant</b>	
SAYERS, Ian, Christison	

- 1. The designated Office is hereby notified of its election made:**

in the demand filed with the International Preliminary Examining Authority on:

19 February 1999 (19.02.99)

in a notice effecting later election filed with the International Bureau on:

2. The election  was

X

was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

# PATENT COOPERATION TREATY

## PCT

### INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference IM/LD/P/11065.WO	<b>FOR FURTHER ACTION</b>		See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/GB98/02168	International filing date (day/month/year) 20/07/1998	Priority date (day/month/year) 24/07/1997	
International Patent Classification (IPC) or national classification and IPC D21F1/00			
Applicant SCAPA GROUP PLC et al.			

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 7 sheets, including this cover sheet.

- This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 6 sheets.

3. This report contains indications relating to the following items:

- I     Basis of the report
- II     Priority
- III     Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV     Lack of unity of invention
- V     Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI     Certain documents cited
- VII     Certain defects in the international application
- VIII     Certain observations on the international application

Date of submission of the demand 19/02/1999	Date of completion of this report 23.07.99
Name and mailing address of the international preliminary examining authority:   European Patent Office D-80298 Munich Tel. (+49-89) 2399-0 Tx: 523656 epmu d Fax: (+49-89) 2399-4465	Authorized officer  Maisonnier, C Telephone No. (+49-89) 2399



**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/GB98/02168

**I. Basis of the report**

1. This report has been drawn on the basis of (*substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.*):

**Description, pages:**

1,4-10                  as originally filed

2,3                  as received on                  05/07/1999 with letter of                  02/07/1999

**Claims, No.:**

1-25                  as received on                  05/07/1999 with letter of                  02/07/1999

**Drawings, sheets:**

1/1                  as originally filed

2. The amendments have resulted in the cancellation of:

the description,        pages:  
 the claims,               Nos.:               26  
 the drawings,            sheets:

3.  This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

4. Additional observations, if necessary:

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/GB98/02168

**V. Reasons statement under Article 35(2) with regard to novelty, inventiveness step or industrial applicability; citations and explanations supporting such statement**

**1. Statement**

Novelty (N)	Yes:	Claims
	No:	Claims 1-12,14,21,24,25
Inventive step (IS)	Yes:	Claims
	No:	Claims 12-25
Industrial applicability (IA)	Yes:	Claims 1-25
	No:	-- Claims

**2. Citations and explanations**

**see separate sheet**

**VII. Certain defects in the international application**

The following defects in the form or contents of the international application have been noted:

**see separate sheet**

**VIII. Certain observations on the international application**

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

**see separate sheet**

**INTERNATIONAL PRELIMINARY  
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International application No. PCT/GB98/02168

1. Reference is made to the following documents:

D1: WO-A-96/27044 *Maelnlycke - Holm et al*  
D2: US-A-5 041 304 *Kusano et al*  
D3: EP-A-0 492 649 *Amann et al*  
D4: US-A-5 344 462 *Paskalov et al* -  
D5: US-A-5 622 773 *Reiners et al*  
D6: US-A-4 743 494  
D7: EP-A-0 396 329  
D8: EP-A-0 695 622  
D9: US-A-5 328 576

Documents D6 to D9 were not cited in the international search report.

2. Papermaking or filter fabrics comprising or including a layer or component of synthetic yarns or fibres which have been subjected to a treatment are well-known in the art.

The subject-matter of Claim 1 differs therefrom only in that the treatment has been effected by means of a plasma.

This feature is however not recognisable on the finished fabric, so that the claimed fabrics cannot be distinguished thereby from the prior art fabrics.

The subject-matter of Claim 1 is therefore not novel (Article 33(2) PCT).

3. Dependent fabric Claims 2 to 11 define only features of the treatment process to which the fabric has been subjected, features which are not recognisable in the treated product, and, are thus not limiting for the fabric.

Thus, the subject-matter of Claims 2 to 11 is also not novel (Article 33(2) PCT).

4. Papermaking and filter fabrics in which the treated synthetic fibres are in the form of yarns which are made up into a woven or non-woven layer, or in which the treated synthetic yarns or fibres are in the form of a woven textile layer having at

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/GB98/02168

least one surface which has been treated are well-known in the art.

Thus, the fabric according to Claims 24 and 25 is also not novel (Article 33(2) PCT).

5. It should further be noted that filter fabrics comprising or including a layer or component of synthetic yarns or fibres which have been subjected to plasma treatment are already known from Documents D6 (see column 1, lines 11-14; column 3, lines 6-13) and D7 (see page 2, lines 23-49), and that according to D6, the plasma comprises oxygen and helium, while, according to Document D7, the synthetic fibres are in the form of yarns which are made up into a woven layer having at least one surface thereof which has been exposed to plasma treatment.
6. Documents D6 and D7 both disclose a method of making or preparing a filter fabric including the step of subjecting at least one surface of a layer or component of the fabric comprises or includes synthetic yarns or fibres to plasma treatment.

Thus, the subject-matter of Claim 12 is not novel (Article 33(2) PCT).

7. Document D6 discloses a plasma treatment, in which the plasma comprises oxygen and helium, and according to D7, the treated yarns or fibres are in the form of a woven layer having at least one surface thereof which is exposed to plasma treatment.

Thus, the methods according Claims 14, 21 and 25 are also not novel (Article 33(2) PCT).

8. Moreover, as acknowledged in the description, methods of making or preparing a papermaking fabric including the step of subjecting at least one surface of a layer or component of the fabric which comprises or includes synthetic yarns or fibres to a treatment with a liquid medium are well known in the art.

The method of making or preparing a papermaking fabric according to Claim 12 differs therefrom only in that the treatment is effected by means of a plasma.

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International application No. PCT/GB98/02168

According to page 2 of the description, the problem to be solved thereby is to provide an economical and environmentally improved alternative to a treatment with a liquid medium.

However, it has already been suggested in Document D8 (see column 1, lines 25-43; column 2, line 38 - column 4, line 5; column 5, lines 20-59) to replace treatments of fabrics with a liquid medium by plasma treatments for economical and environmental reasons. According Document D8, such a treatment can be applied to any type of fabrics. Thus, it would be obvious to the person skilled in the art, namely when the same result is to be achieved, to replace the treatment with a liquid medium as known from the prior art by a plasma treatment.

Thus, the method of making or preparing a papermaking fabric according to Claim 12, does not involve an inventive step (Article 33(3) PCT).

9. Moreover, the methods according to dependent Claims 13 to 21, 24 and 25 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of inventive step (Article 33(3) PCT), the features thereof being already suggested by the following documents:

- Claim 13: see Documents D1, D3, D4, D5, D9.  
Claim 14: see Documents D1, D3, D4, D5, D6, D8, D9  
Claims 15-18: see Documents D2, D5, D8  
Claim 19: see Document D9  
Claim 20: see Document D2  
Claim 21: see Documents D1, D2, D5, D6  
Claim 24: see Documents D3, D5  
Claim 25: see Documents D3, D5, D7, D8

10. Document D8 discloses an apparatus including a plasma chamber to which material comprising synthetic yarns or fibres forming part of or for use in making a fabric can be introduced and removed after treatment.

Thus, the subject-matter of Claim 22 is not novel (Article 33(2) PCT).

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11. The apparatus known from Document D8 also comprises means for continuously introducing material into the plasma chamber, means for moving the material through the chamber during treatment, and means for causing the material to leave the chamber after treatment.

Thus, the subject-matter of Claim 23 is also not novel (Article 33(2) PCT).

12. Moreover, Documents D1 to D7 and D9 are also novelty-destroying for Claim 22 and Document D1 is also novelty-destroying for Claim 23 (Article 33(2) PCT).
13. The following points are moreover to be noted:
  - a. Dependent Claims 24 and 25 should have been formulated as claims either for a fabric or for a method, but not for both (Article 6 PCT).
  - b. Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in Documents D1 to D9 is not mentioned in the description, nor are these documents identified therein.
  - c. The embodiments of the invention described on page 2, lines 13-15, on page 7, lines 15-18, on page 8, lines 19-21, and on page 9, lines 1-2 do not all fall within the scope of the amended claims. This inconsistency between the claims and the description leads to a doubt concerning the matter for which protection is sought, thereby rendering the claims unclear (Article 6 PCT).

replace by  
Art 34

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surface characteristics, the technology of plasma treatment is in the process of being developed. A 'plasma' is a fluid state of matter wherein due to excitation, the matter is present in the form of positive and negative ions. Polar molecules may be dissociated into anionic and cationic radicals, whilst 5 free atoms lose electrons to form free electrons and positively charged atoms - depending upon the degree of excitation, more than one electron may be stripped from atomic shells. Plasmas can exist over an extremely wide range of temperature and pressure; from over atmospheric to near vacuum. Because matter in the plasma exists in the form of charged ions, 10 the plasma environment is extremely chemically energetic, and it has been proposed to treat the surfaces of materials by exposure to plasmas of selected composition.

It is an object of the present invention to provide fabrics for use in industrial processes, such as in papermaking machines, conveyor belts, 15 printing blankets and filtration fabrics by way of non-limiting example, which have had surface properties modified by plasma treatment, as an economical and environmentally improved alternative to treatment or coating with a liquid medium.

According to the invention an industrial fabric comprises or includes 20 a layer or component of synthetic yarns or fibres which have been subjected to plasma treatment.

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From another aspect the invention provides a method of making or preparing an industrial fabric including the step of subjecting at least one surface of a layer or component of the fabric comprised of synthetic yarns or fibres to plasma treatment.

5       The invention also includes apparatus for use in making or preparing an industrial fabric, including a plasma chamber to which material containing synthetic yarns or fibres comprising or for use in making said fabric may be introduced, and removed after treatment.

10      The purpose of the plasma treatment may be to modify the wetting characteristics of the yarn or fibre surface being treated, i.e. to render the surface hydrophobic or hydrophilic.

15      Alternatively the yarn or fibre surface is provided with activated sites to improve subsequent coating or dyeing. This treatment may utilise glow discharge dielectric barrier discharge or spray discharge plasma. Compared with corona discharge treatment techniques the modified characteristics of the treated surface are permanent and far more durable.

Other characteristics can be enhanced by appropriate choice of composition of the plasma, e.g. improved softness in drying felts especially for tissue making machines, crease resistance and antistatic properties.

20      In a preferred method of the invention, hydrophilic properties are enhanced by subjecting the surface to a plasma comprising or containing

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### **CLAIMS**

1. An industrial fabric comprising or including a layer of component of synthetic yarns or fibres, which have been subjected to plasma treatment.
2. An industrial fabric according to claim 1, wherein said fabric includes a layer comprised of synthetic yarns or fibres, a surface of which layer has been subjected to plasma treatment.
3. An industrial fabric according to claim 1 or 2, wherein the yarns or fibres subjected to plasma treatment are provided with activated sites to improve subsequent coating or dyeing.
4. An industrial fabric according to claim 1 or 2, wherein the yarns or fibres have been subjected to a plasma comprising or containing oxygen, air or ammonia.
5. An industrial fabric according to claim 1 or 2, wherein the fibres have been subjected to a plasma comprising or containing silane, siloxane, or a perfluorocarbon.
6. A fabric according to claim 5, wherein said silane is  $\text{Si}(\text{CH}_3)_4$ .
7. A fabric according to claim 5, wherein said siloxane is  $\text{Si}(\text{OCH}_3)_4$ .
8. A fabric according to claim 5, wherein said perfluorocarbon is 1-6C perfluoroalkane, or tetrafluoroethylene or a combination thereof.
9. A fabric according to claim 1 or 2, wherein the fibres have been subjected to a plasma comprising or containing a hydrocarbon.

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10. A fabric according to claim 1 or 2, wherein the yarns or fibres have been subjected to a plasma comprising or containing one or more halogenated hydrocarbons or unsaturated amines.
11. A fabric according to any preceding claim, wherein the plasma is diluted by helium.
12. A method of making or preparing an industrial fabric including the step of subjecting at least one surface of a layer or component of the fabric which comprises or includes synthetic yarns or fibres to plasma treatment.
13. A method according to claim 12, wherein said plasma treatment provides activated sites to improve subsequent coating or dyeing.
14. A method according to claim 12, wherein the plasma contains oxygen, air or ammonia.
15. A method according to claim 12, wherein the plasma contains a silane, a siloxane, or a perfluorocarbon.
16. A method according to claim 15, wherein the silane is  $\text{Si}(\text{CH}_3)_4$ .
17. A method according to claim 15, wherein siloxane is  $\text{Si}(\text{OCH}_3)_4$ .
18. A method according to claim 15, wherein the perfluorocarbon is 1-6C perfluoroalkane, tetrachloroethylene, or a combination thereof.
19. A method according to claim 12, wherein the plasma contains a hydrocarbon.
20. A method according to claim 12, wherein the plasma contains one or

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more halogenated hydrocarbons or unsaturated amines.

21. A method according to any one of claims 12 to 20, wherein the plasma is diluted by helium.

22. Apparatus for use in the method of claim 12, including a plasma chamber to which material comprising synthetic yarns or fibres forming part of or for use in making a fabric can be introduced and removed after treatment.

5 23. Apparatus according to claim 22, comprising means for continuously introducing material into the plasma chamber, means for moving the material through the chamber during treatment, and means for causing the material to leave the chamber after treatment.

10 24. A fabric or method according to any preceding claim, wherein the synthetic fibres are in the form of yarns to be made up into a woven or nonwoven layer.

15 25. A fabric or method according to any preceding claim, wherein the synthetic yarns or fibres are in the form of a woven textile layer, at least one surface of which is exposed to plasma treatment.

20 26. A fabric according to any one of claims 1 to 11, wherein said fabric is, or forms part of, a papermaking machine fabric, an industrial belt or a filter cloth.

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**PCT**

REC'D	27 JUL 1999
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**INTERNATIONAL PRELIMINARY EXAMINATION REPORT**

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference  IM/LD/P/11065.WO	<b>FOR FURTHER ACTION</b>	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No.  PCT/GB98/02168	International filing date (day/month/year)  20/07/1998	Priority date (day/month/year)  24/07/1997
International Patent Classification (IPC) or national classification and IPC D21F1/00		
Applicant SCAPA GROUP PLC et al.		
1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.		
2. This REPORT consists of a total of 7 sheets, including this cover sheet.  <input checked="" type="checkbox"/> This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).		
These annexes consist of a total of 6 sheets.		
3. This report contains indications relating to the following items:  I <input checked="" type="checkbox"/> Basis of the report II <input type="checkbox"/> Priority III <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability IV <input type="checkbox"/> Lack of unity of invention V <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement VI <input type="checkbox"/> Certain documents cited VII <input checked="" type="checkbox"/> Certain defects in the international application VIII <input checked="" type="checkbox"/> Certain observations on the international application		

Date of submission of the demand  19/02/1999	Date of completion of this report  23.07.99
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. (+49-89) 2399-0 Tx: 523656 epmu d Fax: (+49-89) 2399-4465	Authorized officer  Maisonnier, C Telephone No. (+49-89) 2399



**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/GB98/02168

**I. Basis of the report**

1. This report has been drawn on the basis of (*substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.*):

**Description, pages:**

1,4-10	as originally filed		
2,3	as received on	05/07/1999 with letter of	02/07/1999

**Claims, No.:**

1-25	as received on	05/07/1999 with letter of	02/07/1999
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**Drawings, sheets:**

1/1	as originally filed
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2. The amendments have resulted in the cancellation of:

the description,      pages:  
 the claims,      Nos.:      26  
 the drawings,      sheets:

3.  This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

4. Additional observations, if necessary:

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/GB98/02168

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**1. Statement**

Novelty (N)	Yes:	Claims
	No:	Claims 1-12,14,21,24,25
Inventive step (IS)	Yes:	Claims
	No:	Claims 12-25
Industrial applicability (IA)	Yes:	Claims 1-25
	No:	Claims

**2. Citations and explanations**

**see separate sheet**

**VII. Certain defects in the international application**

The following defects in the form or contents of the international application have been noted:

**see separate sheet**

**VIII. Certain observations on the international application**

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

**see separate sheet**

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET**

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International application No. PCT/GB98/02168

1. Reference is made to the following documents:

D1: WO-A-96/27044  
D2: US-A-5 041 304  
D3: EP-A-0 492 649  
D4: US-A-5 344 462  
D5: US-A-5 622 773  
D6: US-A-4 743 494  
D7: EP-A-0 396 329  
D8: EP-A-0 695 622  
D9: US-A-5 328 576

Documents D6 to D9 were not cited in the international search report.

2. Papermaking or filter fabrics comprising or including a layer or component of synthetic yarns or fibres which have been subjected to a treatment are well-known in the art.

The subject-matter of Claim 1 differs therefrom only in that the treatment has been effected by means of a plasma.

This feature is however not recognisable on the finished fabric, so that the claimed fabrics cannot be distinguished thereby from the prior art fabrics.

The subject-matter of Claim 1 is therefore not novel (Article 33(2) PCT).

3. Dependent fabric Claims 2 to 11 define only features of the treatment process to which the fabric has been subjected, features which are not recognisable in the treated product, and, are thus not limiting for the fabric.

Thus, the subject-matter of Claims 2 to 11 is also not novel (Article 33(2) PCT).

4. Papermaking and filter fabrics in which the treated synthetic fibres are in the form of yarns which are made up into a woven or non-woven layer, or in which the treated synthetic yarns or fibres are in the form of a woven textile layer having at

**INTERNATIONAL PRELIMINARY  
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least one surface which has been treated are well-known in the art.

Thus, the fabric according to Claims 24 and 25 is also not novel (Article 33(2) PCT).

5. It should further be noted that filter fabrics comprising or including a layer or component of synthetic yarns or fibres which have been subjected to plasma treatment are already known from Documents D6 (see column 1, lines 11-14; column 3, lines 6-13) and D7 (see page 2, lines 23-49), and that according to D6, the plasma comprises oxygen and helium, while, according to Document D7, the synthetic fibres are in the form of yarns which are made up into a woven layer having at least one surface thereof which has been exposed to plasma treatment.
6. Documents D6 and D7 both disclose a method of making or preparing a filter fabric including the step of subjecting at least one surface of a layer or component of the fabric comprises or includes synthetic yarns or fibres to plasma treatment.

Thus, the subject-matter of Claim 12 is not novel (Article 33(2) PCT).

7. Document D6 discloses a plasma treatment, in which the plasma comprises oxygen and helium, and according to D7, the treated yarns or fibres are in the form of a woven layer having at least one surface thereof which is exposed to plasma treatment.

Thus, the methods according Claims 14, 21 and 25 are also not novel (Article 33(2) PCT).

8. Moreover, as acknowledged in the description, methods of making or preparing a papermaking fabric including the step of subjecting at least one surface of a layer or component of the fabric which comprises or includes synthetic yarns or fibres to a treatment with a liquid medium are well known in the art.

The method of making or preparing a papermaking fabric according to Claim 12 differs therefrom only in that the treatment is effected by means of a plasma.

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International application No. PCT/GB98/02168

According to page 2 of the description, the problem to be solved thereby is to provide an economical and environmentally improved alternative to a treatment with a liquid medium.

However, it has already been suggested in Document D8 (see column 1, lines 25-43; column 2, line 38 - column 4, line 5; column 5, lines 20-59) to replace treatments of fabrics with a liquid medium by plasma treatments for economical and environmental reasons. According Document D8, such a treatment can be applied to any type of fabrics. Thus, it would be obvious to the person skilled in the art, namely when the same result is to be achieved, to replace the treatment with a liquid medium as known from the prior art by a plasma treatment.

Thus, the method of making or preparing a papermaking fabric according to Claim 12 does not involve an inventive step (Article 33(3) PCT).

9. Moreover, the methods according to dependent Claims 13 to 21, 24 and 25 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of inventive step (Article 33(3) PCT), the features thereof being already suggested by the following documents:

Claim 13: see Documents D1, D3, D4, D5, D9.  
Claim 14: see Documents D1, D3, D4, D5, D6, D8, D9  
Claims 15-18: see Documents D2, D5, D8  
Claim 19: see Document D9  
Claim 20: see Document D2  
Claim 21: see Documents D1, D2, D5, D6  
Claim 24: see Documents D3, D5  
Claim 25: see Documents D3, D5, D7, D8

10. Document D8 discloses an apparatus including a plasma chamber to which material comprising synthetic yarns or fibres forming part of or for use in making a fabric can be introduced and removed after treatment.

Thus, the subject-matter of Claim 22 is not novel (Article 33(2) PCT).

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EXAMINATION REPORT - SEPARATE SHEET**

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International application No. PCT/GB98/02168

11. The apparatus known from Document D8 also comprises means for continuously introducing material into the plasma chamber, means for moving the material through the chamber during treatment, and means for causing the material to leave the chamber after treatment.

Thus, the subject-matter of Claim 23 is also not novel (Article 33(2) PCT).

12. Moreover, Documents D1 to D7 and D9 are also novelty-destroying for Claim 22 and Document D1 is also novelty-destroying for Claim 23 (Article 33(2) PCT).
13. The following points are moreover to be noted:
  - a. Dependent Claims 24 and 25 should have been formulated as claims either for a fabric or for a method, but not for both (Article 6 PCT).
  - b. Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in Documents D1 to D9 is not mentioned in the description, nor are these documents identified therein.
  - c. The embodiments of the invention described on page 2, lines 13-15, on page 7, lines 15-18, on page 8, lines 19-21, and on page 9, lines 1-2 do not all fall within the scope of the amended claims. This inconsistency between the claims and the description leads to a doubt concerning the matter for which protection is sought, thereby rendering the claims unclear (Article 6 PCT).

surface characteristics, the technology of plasma treatment is in the process of being developed. A 'plasma' is a fluid state of matter wherein due to excitation, the matter is present in the form of positive and negative ions.

Polar molecules may be dissociated into anionic and cationic radicals, whilst

5 free atoms lose electrons to form free electrons and positively charged atoms - depending upon the degree of excitation, more than one electron may be stripped from atomic shells. Plasmas can exist over an extremely wide range of temperature and pressure; from over atmospheric to near vacuum. Because matter in the plasma exists in the form of charged ions,  
10 the plasma environment is extremely chemically energetic, and it has been proposed to treat the surfaces of materials by exposure to plasmas of selected composition.

It is an object of the present invention to provide fabrics for use in industrial processes, such as in papermaking machines, conveyor belts,  
15 printing blankets and filtration fabrics by way of non-limiting example, which have had surface properties modified by plasma treatment, as an economical and environmentally improved alternative to treatment or coating with a liquid medium.

According to the invention papermaking or filter fabric comprises or  
20 includes a layer or component of synthetic yarns or fibres which have been subjected to plasma treatment.

From another aspect the invention provides a method of making or preparing papermaking or filter fabric including the step of subjecting at least one surface of a layer or component of the fabric comprised of synthetic yarns or fibres to plasma treatment.

5           The invention also includes apparatus for use in making or preparing papermaking or filter fabric, including a plasma chamber to which material containing synthetic yarns or fibres comprising or for use in making said fabric may be introduced, and removed after treatment.

10          The purpose of the plasma treatment may be to modify the wetting characteristics of the yarn or fibre surface being treated, i.e. to render the surface hydrophobic or hydrophilic.

15          Alternatively the yarn or fibre surface is provided with activated sites to improve subsequent coating or dyeing. This treatment may utilise glow discharge dielectric barrier discharge or spray discharge plasma. Compared with corona discharge treatment techniques the modified characteristics of the treated surface are permanent and far more durable.

Other characteristics can be enhanced by appropriate choice of composition of the plasma, e.g. improved softness in drying felts especially for tissue making machines, crease resistance and antistatic properties.

20          In a preferred method of the invention, hydrophilic properties are enhanced by subjecting the surface to a plasma comprising or containing

**CLAIMS**

1. A papermaking fabric or filter fabric comprising or including a layer or component of synthetic yarns or fibres, which have been subjected to plasma treatment.
- 5 2. A papermaking or filter fabric according to claim 1, wherein said fabric includes a layer comprised of synthetic yarns or fibres, a surface of which layer has been subjected to plasma treatment.
3. A papermaking or filter fabric according to claim 1 or 2, wherein the yarns or fibres subjected to plasma treatment are provided with activated sites to improve subsequent coating or dyeing.
- 10 4. A papermaking or filter fabric according to claim 1 or 2, wherein the yarns or fibres have been subjected to a plasma comprising or containing oxygen, air or ammonia.
5. A papermaking or filter fabric according to claim 1 or 2, wherein the fibres have been subjected to a plasma comprising or containing silane, siloxane, or a perfluorocarbon.
- 15 6. A papermaking or filter fabric according to claim 5, wherein said silane is  $\text{Si}(\text{CH}_3)_4$ .
7. A papermaking or filter fabric according to claim 5, wherein said siloxane is  $\text{Si}(\text{OCH}_3)_4$ .
- 20 8. A papermaking or filter fabric according to claim 5, wherein said

perfluorocarbon is 1-6C perfluoroalkane, or tetrafluoroethylene or a combination thereof.

9. A papermaking or filter fabric according to claim 1 or 2, wherein the fibres have been subjected to a plasma comprising or containing a  
5 hydrocarbon.

10. A papermaking or filter fabric according to claim 1 or 2, wherein the yarns or fibres have been subjected to a plasma comprising or containing one or more halogenated hydrocarbons or unsaturated amines.

11. A papermaking or filter fabric according to any preceding claim,  
10 wherein the plasma is diluted by helium.

12. A method of making or preparing papermaking or filter fabric including the step of subjecting at least one surface of a layer or component of the fabric which comprises or includes synthetic yarns or fibres to plasma treatment.

15 13. A method according to claim 12, wherein said plasma treatment provides activated sites to improve subsequent coating or dyeing.

14. A method according to claim 12, wherein the plasma contains oxygen, air or ammonia.

20 15. A method according to claim 12, wherein the plasma contains a silane, a siloxane, or a perfluorocarbon.

16. A method according to claim 15, wherein the silane is Si(CH<sub>3</sub>)<sub>4</sub>.

17. A method according to claim 15, wherein siloxane is Si(OCH<sub>3</sub>)<sub>4</sub>.
18. A method according to claim 15, wherein the perfluorocarbon is 1-6C perfluoroalkane, tetrachloroethylene, or a combination thereof.
19. A method according to claim 12, wherein the plasma contains a hydrocarbon.  
5
20. A method according to claim 12, wherein the plasma contains one or more halogenated hydrocarbons or unsaturated amines.
21. A method according to any one of claims 12 to 20, wherein the plasma is diluted by helium.
- 10 22. Apparatus for use in the method of claim 12, including a plasma chamber to which material comprising synthetic yarns or fibres forming part of or for use in making a fabric can be introduced and removed after treatment.
23. Apparatus according to claim 22, comprising means for continuously introducing material into the plasma chamber, means for moving the material through the chamber during treatment, and means for causing the material to leave the chamber after treatment.  
15
24. A fabric or method according to any preceding claim, wherein the synthetic fibres are in the form of yarns to be made up into a woven or nonwoven layer.  
20
25. A fabric or method according to any preceding claim, wherein the

synthetic yarns or fibres are in the form of a woven textile layer, at least one surface of which is exposed to plasma treatment.

## INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 98/02168

**A. CLASSIFICATION OF SUBJECT MATTER**  
 IPC 6 D21F1/00 D06M10/02

According to International Patent Classification(IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)  
 IPC 6 D21F D06M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 344 462 A (PASKALOV GEORGY Z ET AL) 6 September 1994  see the whole document	1-4, 12-14, 22, 24-26
Y		5,7, 9-11, 15, 17, 19-21
X	US 5 041 304 A (KUSANO YUKIHIRO ET AL) 20 August 1991 see the whole document	1,5,8, 15,18
X	EP 0 492 649 A (AMANN & SOEHNE) ✓ 1 July 1992 see the whole document	1,4,14
		-/-

 Further documents are listed in the continuation of box C. Patent family members are listed in annex.

## \* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

10 November 1998

Date of mailing of the International search report

19/11/1998

Name and mailing address of the ISA  
 European Patent Office, P.B. 5818 Patentlaan 2  
 NL - 2280 HV Rijswijk  
 Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
 Fax: (+31-70) 340-3016

Authorized officer

Guisan, T

## INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 98/02168

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 96 27044 A (MOEMLYCKE AB ;MILDING EBBE (SE); HOLM ULF (SE)) 6 September 1996 see the whole document	5,11,15, 21
Y	US 5 622 773 A (REINER ANDREAS ET AL) 22 April 1997 see the whole document	7,9,10, 17,19,20

**INTERNATIONAL SEARCH REPORT**

Information on patent family members

Int'l. Jonal Application No

PCT/GB 98/02168

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
US 5344462	A	06-09-1994	NONE		
US 5041304	A	20-08-1991	JP	3202145 A	03-09-1991
EP 0492649	A	01-07-1992	DE	4100785 A	02-07-1992
			DE	4100786 A	02-07-1992
			DE	4100787 A	16-07-1992
			AT	141348 T	15-08-1996
			CS	9104081 A	16-09-1992
			DE	59108085 D	19-09-1996
			EP	0496117 A	29-07-1992
WO 9627044	A	06-09-1996	AU	696440 B	10-09-1998
			AU	4893596 A	18-09-1996
			CA	2213809 A	06-09-1996
			CN	1137584 A	11-12-1996
			EP	0833977 A	08-04-1998
			NO	973872 A	22-08-1997
			SE	9500702 A	28-08-1996
US 5622773	A	22-04-1997	CA	2146457 A	16-02-1995
			DE	59400947 D	05-12-1996
			WO	9504854 A	16-02-1995
			EP	0663968 A	26-07-1995
			IL	110454 A	13-07-1997
			JP	8502560 T	19-03-1996

PCT

REQUEST

The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty.

For receiving Office use only

International Application No.

International Filing Date

Name of receiving Office and "PCT International Application"

Applicant's or agent's file reference P/11065.WO  
(if desired) (12 characters maximum)

**Box No. I TITLE OF INVENTION**  
**INDUSTRIAL FABRICS AND METHOD OF TREATMENT**

**Box No. II APPLICANT**

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

**SCAPA GROUP PLC,**  
Oakfield House,  
93 Preston New Road,  
Blackburn, Lancashire,  
BB2 6AY, United Kingdom

This person is also inventor.

Telephone No.

Faxsimile No.

Teleprinter No.

State (that is, country) of nationality:

United Kingdom

State (that is, country) of residence:

United Kingdom

This person is applicant  all designated States  all designated States except the United States of America  the United States of America only  the States indicated in the Supplemental Box

**Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)**

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

**SAYERS, IAN CHRISTISON**  
30 Chesterbrook,  
Ribchester,  
Lancashire,  
PR3 3XT, United Kingdom

This person is:

applicant only

applicant and inventor

inventor only (If this check-box is marked, do not fill in below.)

State (that is, country) of nationality:

United Kingdom

State (that is, country) of residence:

United Kingdom

This person is applicant  all designated States  all designated States except the United States of America  the United States of America only  the States indicated in the Supplemental Box

Further applicants and/or (further) inventors are indicated on a continuation sheet.

**Box No. IV AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE**

The person identified below is hereby/has been appointed to act on behalf of the applicant(s) before the competent International Authorities as:

agent

common representative

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

Telephone No.

0161 834 0936

**MIDDLEMIST, IAN ALASTAIR,**  
WILSON GUNN M'CAW,  
41-51 Royal Exchange, Cross Street,  
Manchester, M2 7BD  
United Kingdom

Faxsimile No.

0161 832 4905

Teleprinter No.

Address for correspondence: Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.

**Box No.V DESIGNATION OF STATES**

The following designations are hereby made under Rule 4.9(a) (*mark the applicable check-boxes; at least one must be marked*):

**Regional Patent**

- AP ARIPO Patent: GH Ghana, GM Gambia, KE Kenya, LS Lesotho, MW Malawi, SD Sudan, SZ Swaziland, UG Uganda, ZW Zimbabwe, and any other State which is a Contracting State of the Harare Protocol and of the PCT
- EA Eurasian Patent: AM Armenia, AZ Azerbaijan, BY Belarus, KG Kyrgyzstan, KZ Kazakhstan, MD Republic of Moldova, RU Russian Federation, TJ Tajikistan, TM Turkmenistan, and any other State which is a Contracting State of the Eurasian Patent Convention and of the PCT
- EP European Patent: AT Austria, BE Belgium, CH and LI Switzerland and Liechtenstein, CY Cyprus, DE Germany, DK Denmark, ES Spain, FI Finland, FR France, GB United Kingdom, GR Greece, IE Ireland, IT Italy, LU Luxembourg, MC Monaco, NL Netherlands, PT Portugal, SE Sweden, and any other State which is a Contracting State of the European Patent Convention and of the PCT
- OA OAPI Patent: BF Burkina Faso, BJ Benin, CF Central African Republic, CG Congo, CI Côte d'Ivoire, CM Cameroon, GA Gabon, GN Guinea, ML Mali, MR Mauritania, NE Niger, SN Senegal, TD Chad, TG Togo, and any other State which is a member State of OAPI and a Contracting State of the PCT (*if other kind of protection or treatment desired, specify on dotted line*)

**National Patent (if other kind of protection or treatment desired, specify on dotted line):**

- |                                                                         |                                                                             |
|-------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| <input type="checkbox"/> AL Albania .....                               | <input type="checkbox"/> LS Lesotho .....                                   |
| <input type="checkbox"/> AM Armenia .....                               | <input type="checkbox"/> LT Lithuania .....                                 |
| <input type="checkbox"/> AT Austria .....                               | <input type="checkbox"/> LU Luxembourg .....                                |
| <input checked="" type="checkbox"/> AU Australia .....                  | <input type="checkbox"/> LV Latvia .....                                    |
| <input type="checkbox"/> AZ Azerbaijan .....                            | <input type="checkbox"/> MD Republic of Moldova .....                       |
| <input type="checkbox"/> BA Bosnia and Herzegovina .....                | <input type="checkbox"/> MG Madagascar .....                                |
| <input type="checkbox"/> BB Barbados .....                              | <input type="checkbox"/> MK The former Yugoslav Republic of Macedonia ..... |
| <input type="checkbox"/> BG Bulgaria .....                              | <input type="checkbox"/> MN Mongolia .....                                  |
| <input type="checkbox"/> BR Brazil .....                                | <input type="checkbox"/> MW Malawi .....                                    |
| <input type="checkbox"/> BY Belarus .....                               | <input type="checkbox"/> MX Mexico .....                                    |
| <input checked="" type="checkbox"/> CA Canada .....                     | <input type="checkbox"/> NO Norway .....                                    |
| <input type="checkbox"/> CH and LI Switzerland and Liechtenstein .....  | <input type="checkbox"/> NZ New Zealand .....                               |
| <input type="checkbox"/> CN China .....                                 | <input type="checkbox"/> PL Poland .....                                    |
| <input type="checkbox"/> CU Cuba .....                                  | <input type="checkbox"/> PT Portugal .....                                  |
| <input type="checkbox"/> CZ Czech Republic .....                        | <input type="checkbox"/> RO Romania .....                                   |
| <input type="checkbox"/> DE Germany .....                               | <input type="checkbox"/> RU Russian Federation .....                        |
| <input type="checkbox"/> DK Denmark .....                               | <input type="checkbox"/> SD Sudan .....                                     |
| <input type="checkbox"/> EE Estonia .....                               | <input type="checkbox"/> SE Sweden .....                                    |
| <input type="checkbox"/> ES Spain .....                                 | <input type="checkbox"/> SG Singapore .....                                 |
| <input type="checkbox"/> FI Finland .....                               | <input type="checkbox"/> SI Slovenia .....                                  |
| <input type="checkbox"/> GB United Kingdom .....                        | <input type="checkbox"/> SK Slovakia .....                                  |
| <input type="checkbox"/> GE Georgia .....                               | <input type="checkbox"/> SL Sierra Leone .....                              |
| <input type="checkbox"/> GH Ghana .....                                 | <input type="checkbox"/> TJ Tajikistan .....                                |
| <input type="checkbox"/> GM Gambia .....                                | <input type="checkbox"/> TM Turkmenistan .....                              |
| <input type="checkbox"/> GW Guinea-Bissau .....                         | <input type="checkbox"/> TR Turkey .....                                    |
| <input type="checkbox"/> HR Croatia .....                               | <input type="checkbox"/> TT Trinidad and Tobago .....                       |
| <input type="checkbox"/> HU Hungary .....                               | <input type="checkbox"/> UA Ukraine .....                                   |
| <input type="checkbox"/> ID Indonesia .....                             | <input type="checkbox"/> UG Uganda .....                                    |
| <input type="checkbox"/> IL Israel .....                                | <input checked="" type="checkbox"/> US United States of America .....       |
| <input type="checkbox"/> IS Iceland .....                               | <input type="checkbox"/> UZ Uzbekistan .....                                |
| <input checked="" type="checkbox"/> JP Japan .....                      | <input type="checkbox"/> VN Viet Nam .....                                  |
| <input type="checkbox"/> KE Kenya .....                                 | <input type="checkbox"/> YU Yugoslavia .....                                |
| <input type="checkbox"/> KG Kyrgyzstan .....                            | <input type="checkbox"/> ZW Zimbabwe .....                                  |
| <input type="checkbox"/> KP Democratic People's Republic of Korea ..... |                                                                             |
| <input checked="" type="checkbox"/> KR Republic of Korea .....          |                                                                             |
| <input type="checkbox"/> KZ Kazakhstan .....                            |                                                                             |
| <input type="checkbox"/> LC Saint Lucia .....                           |                                                                             |
| <input type="checkbox"/> LK Sri Lanka .....                             |                                                                             |
| <input type="checkbox"/> LR Liberia .....                               |                                                                             |

Check-boxes reserved for designating States (for the purposes of a national patent) which have become party to the PCT after issuance of this sheet:

- .....
- .....

**Precautionary Designation Statement:** In addition to the designations made above, the applicant also makes under Rule 4.9(b) all other designations which would be permitted under the PCT except any designation(s) indicated in the Supplemental Box as being excluded from the scope of this statement. The applicant declares that those additional designations are subject to confirmation and that any designation which is not confirmed before the expiration of 15 months from the priority date is to be regarded as withdrawn by the applicant at the expiration of that time limit. (*Confirmation of a designation consists of the filing of a notice specifying that designation and the payment of the designation and confirmation fees. Confirmation must reach the receiving Office within the 15-month time limit.*)

**Supplemental Box**      If the Supplemental Box is not used, this sheet should not be included in the request.

1. If, in any of the Boxes, the space is insufficient to furnish all the information: in such case, write "Continuation of Box No. ..." [indicate the number of the Box] and furnish the information in the same manner as required according to the captions of the Box in which the space was insufficient, in particular:

- (i) if more than two persons are involved as applicants and/or inventors and no "continuation sheet" is available: in such case, write "Continuation of Box No. III" and indicate for each additional person the same type of information as required in Box No. III. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below;
- (ii) if, in Box No. II or in any of the sub-boxes of Box No. III, the indication "the States indicated in the Supplemental Box" is checked: in such case, write "Continuation of Box No. II" or "Continuation of Box No. III" or "Continuation of Boxes No. II and No. III" (as the case may be), indicate the name of the applicant(s) involved and, next to (each) such name, the State(s) (and/or, where applicable, ARIPO, Eurasian, European or OAPI patent) for the purposes of which the named person is applicant;
- (iii) if, in Box No. II or in any of the sub-boxes of Box No. III, the inventor or the inventor/applicant is not inventor for the purposes of all designated States or for the purposes of the United States of America: in such case, write "Continuation of Box No. II" or "Continuation of Box No. III" or "Continuation of Boxes No. II and No. III" (as the case may be), indicate the name of the inventor(s) and, next to (each) such name, the State(s) (and/or, where applicable, ARIPO, Eurasian, European or OAPI patent) for the purposes of which the named person is inventor;
- (iv) if, in addition to the agent(s) indicated in Box No. IV, there are further agents: in such case, write "Continuation of Box No. IV" and indicate for each further agent the same type of information as required in Box No. IV;
- (v) if, in Box No. V, the name of any State (or OAPI) is accompanied by the indication "patent of addition," or "certificate of addition," or if, in Box No. V, the name of the United States of America is accompanied by an indication "continuation" or "continuation-in-part": in such case, write "Continuation of Box No. V" and the name of each State involved (or OAPI), and after the name of each such State (or OAPI), the number of the parent title or parent application and the date of grant of the parent title or filing of the parent application;
- (vi) if, in Box No. VI, there are more than three earlier applications whose priority is claimed: in such case, write "Continuation of Box No. VI" and indicate for each additional earlier application the same type of information as required in Box No. VI;
- (vii) if, in Box No. VI, the earlier application is an ARIPO application: in such case, write "Continuation of Box No. VI", specify the number of the item corresponding to that earlier application and indicate at least one country party to the Paris Convention for the Protection of Industrial Property for which that earlier application was filed.

2. If, with regard to the precautionary designation statement contained in Box No. V, the applicant wishes to exclude any State(s) from the scope of that statement: in such case, write "Designation(s) excluded from precautionary designation statement" and indicate the name or two-letter code of each State so excluded.

3. If the applicant claims, in respect of any designated Office, the benefits of provisions of the national law concerning non-prejudicial disclosures or exceptions to lack of novelty: in such case, write "Statement concerning non-prejudicial disclosures or exceptions to lack of novelty" and furnish that statement below.

### CONTINUATION OF BOX IV

QUEST, BARRY  
 DOWNEY, WILLIAM GERRARD  
 GOODWIN, MARK  
 HILL, RICHARD  
 PHILLIPS, PATRICIA MARIE

of

WILSON GUNN M'CAW  
 41-51 ROYAL EXCHANGE  
 CROSS STREET  
 MANCHESTER  
 M2 7BD  
 UNITED KINGDOM

Box No. VI PRIORITY CLAIM		<input type="checkbox"/> Further priority claims are indicated in the Supplemental Box.		
Filing date of earlier application (day/month/year)	Number of earlier application	Where earlier application is:		
		national application: country	regional application: regional Office	international application: receiving Office
item (1) <b>24/07/97</b> <b>24<sup>th</sup> July 1997</b>	<b>9715508.9</b>	<b>G.B.</b>		
item (2)				
item (3)				

The receiving Office is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) (*only if the earlier application was filed with the Office which for the purposes of the present international application is the receiving Office*) identified above as item(s): (1)

\* Where the earlier application is an ARIPO application, it is mandatory to indicate in the Supplemental Box at least one country party to the Paris Convention for the Protection of Industrial Property for which that earlier application was filed (Rule 4.10(b)(ii)). See Supplemental Box.

#### Box No. VII INTERNATIONAL SEARCHING AUTHORITY

Choice of International Searching Authority (ISA) (if two or more International Searching Authorities are competent to carry out the international search, indicate the Authority chosen; the two-letter code may be used):

ISA /

Request to use results of earlier search; reference to that search (if an earlier search has been carried out by or requested from the International Searching Authority):

Date (day/month/year) Number Country (or regional Office)

#### Box No. VIII CHECK LIST; LANGUAGE OF FILING

This international application contains the following number of sheets:

request	: 4
description (excluding sequence listing part)	: 10
claims	: 3
abstract	: 1
drawings	: 1
sequence listing part of description	:
Total number of sheets	: 19

This international application is accompanied by the item(s) marked below:

1.  fee calculation sheet
2.  separate signed power of attorney
3.  copy of general power of attorney; reference number, if any:
4.  statement explaining lack of signature
5.  priority document(s) identified in Box No. VI as item(s):
6.  translation of international application into (language):
7.  separate indications concerning deposited microorganism or other biological material
8.  nucleotide and/or amino acid sequence listing in computer readable form
9.  other (specify): Form 23/77

Figure of the drawings which should accompany the abstract:

Language of filing of the international application: English

#### Box No. IX SIGNATURE OF APPLICANT OR AGENT

Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the request).

MIDDLEMIST, IAN ALASTAIR  
(AUTHORISED REPRESENTATIVE)

For receiving Office use only

1. Date of actual receipt of the purported international application:
3. Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application:
4. Date of timely receipt of the required corrections under PCT Article 11(2):
5. International Searching Authority ISA /
6.  Transmittal of search copy delayed until search fee is paid.

2. Drawings:

received:

not received:

For International Bureau use only

Date of receipt of the record copy by the International Bureau:

## PATENT COOPERATION TREATY

PCT

**NOTIFICATION CONCERNING  
SUBMISSION OR TRANSMITTAL  
OF PRIORITY DOCUMENT**

(PCT Administrative Instructions, Section 411)

From the INTERNATIONAL BUREAU

To:

MIDDLEMIST, Ian, Alastair  
 Wilson Gunn M'Caw  
 41-51 Royal Exchange  
 Cross Street  
 Manchester M2 7BD  
 ROYAUME-UNI

Date of mailing (day/month/year) <b>28 August 1998 (28.08.98)</b>	
Applicant's or agent's file reference <b>P/11065.WO</b>	<b>IMPORTANT NOTIFICATION</b>
International application No. <b>PCT/GB98/02168</b>	International filing date (day/month/year) <b>20 July 1998 (20.07.98)</b>
International publication date (day/month/year) <b>Not yet published</b>	Priority date (day/month/year) <b>24 July 1997 (24.07.97)</b>
Applicant <b>SCAPA GROUP PLC et al</b>	S175 1M

1. The applicant is hereby notified of the date of receipt (except where the letters "NR" appear in the right-hand column) by the International Bureau of the priority document(s) relating to the earlier application(s) indicated below. Unless otherwise indicated by an asterisk appearing next to a date of receipt, or by the letters "NR", in the right-hand column, the priority document concerned was submitted or transmitted to the International Bureau in compliance with Rule 17.1(a) or (b).
2. This updates and replaces any previously issued notification concerning submission or transmittal of priority documents.
3. An asterisk(\*) appearing next to a date of receipt, in the right-hand column, denotes a priority document submitted or transmitted to the International Bureau but not in compliance with Rule 17.1(a) or (b). In such a case, the attention of the applicant is directed to Rule 17.1(c) which provides that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity, upon entry into the national phase, to furnish the priority document within a time limit which is reasonable under the circumstances.
4. The letters "NR" appearing in the right-hand column denote a priority document which was not received by the International Bureau or which the applicant did not request the receiving Office to prepare and transmit to the International Bureau, as provided by Rule 17.1(a) or (b), respectively. In such a case, the attention of the applicant is directed to Rule 17.1(c) which provides that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity, upon entry into the national phase, to furnish the priority document within a time limit which is reasonable under the circumstances.

<u>Priority date</u>	<u>Priority application No.</u>	<u>Country or regional Office or PCT receiving Office</u>	<u>Date of receipt of priority document</u>
24 July 1997 (24.07.97)	9715508.9	GB	17 Aug 1998 (17.08.98)

DETAILS NOTED ON THE  
RECORD CARD  
DAY CARD FOR  
PROGRESSOR  
FILE  
BY AM (INITIALS)

**RECEIVED**  
11 SEP 1998  
**REGISTRED**

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. (41-22) 740.14.35	Authorized officer <b>Marc Salzman</b> Telephone No. (41-22) 338.83.38
----------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------

## PATENT COOPERATION TREATY

PCT

## NOTICE INFORMING THE APPLICANT OF THE COMMUNICATION OF THE INTERNATIONAL APPLICATION TO THE DESIGNATED OFFICES

(PCT Rule 47.1(c), first sentence)

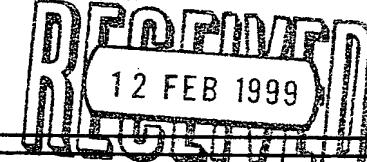
Date of mailing (day/month/year)

04 February 1999 (04.02.99)

From the INTERNATIONAL BUREAU

To:

MIDDLEMIST, Ian, Alastair  
 Wilson Gunn M'Caw  
 41-51 Royal Exchange  
 Cross Street  
 Manchester M2 7BD  
 ROYAUME-UNI



Applicant's or agent's file reference

P/11065.WO

## IMPORTANT NOTICE

International application No.

PCT/GB98/02168

International filing date (day/month/year)

20 July 1998 (20.07.98)

Priority date (day/month/year)

24 July 1997 (24.07.97)

Applicant

SCAPA GROUP PLC et al

S175 .

1. Notice is hereby given that the International Bureau has communicated, as provided in Article 20, the international application to the following designated Offices on the date indicated above as the date of mailing of this Notice:  
**AU,EP,JP,KR,US**

In accordance with Rule 47.1(c), third sentence, those Offices will accept the present Notice as conclusive evidence that the communication of the international application has duly taken place on the date of mailing indicated above and no copy of the international application is required to be furnished by the applicant to the designated Office(s).

2. The following designated Offices have waived the requirement for such a communication at this time:

**CA**

The communication will be made to those Offices only upon their request. Furthermore, those Offices do not require the applicant to furnish a copy of the international application (Rule 49.1(a-bis)).

3. Enclosed with this Notice is a copy of the international application as published by the International Bureau on 04 February 1999 (04.02.99) under No. WO 99/05358

**REMINDER REGARDING CHAPTER II (Article 31(2)(a) and Rule 54.2)**

If the applicant wishes to postpone entry into the national phase until 30 months (or later in some Offices) from the priority date, a demand for international preliminary examination must be filed with the competent International Preliminary Examining Authority before the expiration of 19 months from the priority date.

It is the applicant's sole responsibility to monitor the 19-month time limit.

Note that only an applicant who is a national or resident of a PCT Contracting State which is bound by Chapter II has the right to file a demand for international preliminary examination.

**REMINDER REGARDING ENTRY INTO THE NATIONAL PHASE (Article 22 or 39(1))**

If the applicant wishes to proceed with the international application in the national phase, he must, within 20 months or 30 months, or later in some Offices, perform the acts referred to therein before each designated or elected Office.

For further important information on the time limits and acts to be performed for entering the national phase, see the Annex to Form PCT/IB/301 (Notification of Receipt of Record Copy) and Volume II of the PCT Applicant's Guide.

The International Bureau of WIPO  
 34, chemin des Colombettes  
 1211 Gen ve 20, Switzerland

Facsimile No. (41-22) 740.14.35

Authorized officer

*J. Zahra*

Huber

*C. TES*

Telephone No. (41-22) 338.83.38

PATENT COOPERATION TREA  
PCT

09/462806

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference  P/11065.W0	<b>FOR FURTHER ACTION</b> see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No.  PCT/GB 98/ 02168	International filing date (day/month/year)  20/07/1998	(Earliest) Priority Date (day/month/year)  24/07/1997
Applicant  SCAPA GROUP PLC et al.		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 3 sheets.

It is also accompanied by a copy of each prior art document cited in this report.

1.  Certain claims were found unsearchable (see Box I).
2.  Unity of invention is lacking (see Box II).
3.  The international application contains disclosure of a nucleotide and/or amino acid sequence listing and the international search was carried out on the basis of the sequence listing
  - filed with the international application.
  - furnished by the applicant separately from the international application,
    - but not accompanied by a statement to the effect that it did not include matter going beyond the disclosure in the international application as filed.
  - Transcribed by this Authority
4. With regard to the title,  the text is approved as submitted by the applicant  
 the text has been established by this Authority to read as follows:
5. With regard to the abstract,  the text is approved as submitted by the applicant  
 the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this International Search Report, submit comments to this Authority.
6. The figure of the drawings to be published with the abstract is:  
 Figure No. 1  as suggested by the applicant.  
 because the applicant failed to suggest a figure.  
 because this figure better characterizes the invention.

## INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 98/02168

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 D21F1/00 D06M10/02

According to International Patent Classification(IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 D21F D06M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 344 462 A (PASKALOV GEORGY Z ET AL) 6 September 1994  see the whole document	1-4, 12-14, 22, 24-26
Y	---	5, 7, 9-11, 15, 17, 19-21
X	US 5 041 304 A (KUSANO YUKIHIRO ET AL) 20 August 1991 see the whole document ---	1, 5, 8, 15, 18
X	EP 0 492 649 A (AMANN & SOEHNE) 1 July 1992 see the whole document ---	1, 4, 14
		-/-

 Further documents are listed in the continuation of box C. Patent family members are listed in annex.

## ° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&amp;" document member of the same patent family

Date of the actual completion of the international search

Date of mailing of the international search report

10 November 1998

19/11/1998

Name and mailing address of the ISA

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Fax: (+31-70) 340-3016

Authorized officer

Guisan, T

## INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 98/02168

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 96 27044 A (MOELNLYCKE AB ;MILDING EBBE (SE); HOLM ULF (SE)) 6 September 1996 see the whole document -----	5,11,15, 21
Y	US 5 622 773 A (REINER ANDREAS ET AL) 22 April 1997 see the whole document -----	7,9,10, 17,19,20

## INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/GB 98/02168

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
US 5344462	A	06-09-1994	NONE		
US 5041304	A	20-08-1991	JP	3202145 A	03-09-1991
EP 0492649	A	01-07-1992	DE	4100785 A	02-07-1992
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			IL	110454 A	13-07-1997
			JP	8502560 T	19-03-1996

## INTERNATIONAL SEARCH REPORT

Int'l. Jpn. Application No
PCT/GB 98/02168

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 D21F1/00 D06M10/02

According to International Patent Classification(IPC) or to both national classification and IPC

B. FIELDS SEARCHED
--------------------

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 D21F D06M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT
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- "A" document defining the general state of the art which is not considered to be of particular relevance
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- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- "Z" document member of the same patent family

Date of the actual compilation of the international search

10 November 1998

Date of mailing of the international search report

19/11/1998

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## INTERNATIONAL SEARCH REPORT

International Application No  
PCT/GB 98/02168

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 96 27044 A (MOEMLYCKE AB ;MILDING EBBE (SE); HOLM ULF (SE)) 6 September 1996 see the whole document	5,11,15, 21
Y	US 5 622 773 A (REINER ANDREAS ET AL) 22 April 1997 see the whole document	7,9,10, 17,19,20

# INTERNATIONAL SEARCH REPORT

Information on patent family members

Int'l. Application No

PCT/GB 98/02168

Patent document cited in search report	Publication date	Patent family member(s)		Publication date
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